

AMENDMENTS TO THE SPECIFICATION

In compliance with the Examiner's instructions, Applicants request the following amendment be made to the originally filed Specification:

In Paragraph [0001]

This application is a continuation-in-part of co-pending, commonly assigned U.S. Patent Application No. 09/196,709 filed on November 20, 1998, now U.S. Patent No. 6,434,195B1.

This application claims the benefit of U.S. provisional patent application no. 60/238,495 filed on October 6, 2000.

AMENDMENTS TO THE CLAIMS

Amend the claims as follows:

1. (presently allowed) A method for transcoding progressive I-slice refreshed MPEG data streams to enable trick play mode features on a television appliance, comprising the steps of: receiving at the appliance a progressive I- slice refreshed MPEG data stream having I-slices distributed over multiple P- frames; decoding the P-frames to recover the I-slices which make up a complete I- frame; assembling the recovered I-slices into a complete I-frame; encoding the complete I-frame; replacing a selected P- frame in the MPEG data stream with the encoded I-frame to provide an I- frame based MPEG data stream; and storing the I-frame based MPEG data stream for trick play mode use.
2. (presently allowed) A method in accordance with claim 1, comprising: storing each recovered I-slice in memory as each P-frame is decoded until all I- slices required to assemble a complete I-frame are recovered from the decoded P-frames.
3. (presently allowed) A method in accordance with claim 1, comprising: storing the received progressive I-slice refreshed MPEG data stream.

4. (presently allowed) A method in accordance with claim 1, wherein the I-frame based data stream is stored on one of a personal versatile recorder (PVR), a digital video recorder, a set-top terminal, a digital television, or a personal computer.
5. (presently allowed) A method in accordance with claim 1, wherein: a number N of P-frames are decoded to recover the I-slices which make up the complete I- frame; and the encoded I-frame is inserted into the MPEG data stream in place of Nth P-frame.
6. (presently allowed) A method in accordance with claim 5, wherein: one or more additional P frames are decoded to recover additional I-slices; the additional I-slices allow assembly of additional complete I-frames; and said additional complete I-frames are insertable after encoding into the MPEG data stream at a programmable rate.
7. (presently allowed) A method in accordance with claim 1, comprising: inserting additional I-frames into the I-frame based data stream at a programmable interval.
8. (presently allowed) A method in accordance with claim 1, wherein the encoded I- frame replaces the selected Pframe at least once per refresh cycle.
9. (presently allowed) A method in accordance with claim 1, wherein the trick play mode features comprise at least one of pause, scan forward, scan backward, jump, and still frame display.
10. (as originally filed) A method in accordance with claim 1, comprising: determining whether the data stream is an I-frame based MPEG data stream or a progressive I-slice refreshed MPEG data stream, such that, in the event that the data stream is an I-frame based MPEG data stream, the data stream is stored for trick play mode use without further processing.
11. (As originally filed) A method in accordance with claim 1, comprising: determining whether the data stream is an I-frame based MPEG data stream or a progressive I-slice refreshed MPEG data stream; and in the event that the data stream is an I-frame based MPEG data stream, inserting additional I-frames into the data stream prior to storing the data stream for trick play mode use.

12. (presently allowed) A method in accordance with claim 1, wherein the television appliance is one of a personal versatile recorder (PVR), a digital video recording device, a set-top terminal, a digital television, or a personal computer.

13. (presently allowed) A method in accordance with claim 1, wherein: the P-frames are re-encoded using motion estimation techniques in order to remove the I- slices.

14. (presently allowed) A television appliance capable of transcoding progressive I- slice refreshed MPEG data streams to enable trick play mode features, comprising: a receiver for receiving a progressive I-slice refreshed MPEG data stream having I-slices distributed over multiple P-frames; a decoder for decoding the P-frames to recover the I-slices which make up a complete I- frame; a processor associated with the decoder for assembling the recovered I- slices into a complete I-frame; an encoder for encoding the complete I-frame; and a multiplexer for replacing a selected P-frame in the MPEG data stream with the encoded I-frame to provide an encoded I- frame based MPEG stream; wherein: said I-frame based data MPEG stream is stored on a storage device for trick play mode use.

15. (presently allowed) An appliance in accordance with claim 14, comprising: memory for storing each recovered I-slice as each P-frame is decoded until all I- slices required to assemble a complete I-frame are recovered from the decoded P-frames.

16. (presently allowed) An appliance in accordance with claim 14, comprising: memory for storing the received progressive I-slice refreshed MPEG data stream.

17. (presently cancelled) ~~An appliance in accordance with claim 14, comprising said storage device.~~

18. (presently allowed) An appliance in accordance with claim 14, wherein said storage device is external to said television appliance.

19. (presently allowed) An appliance in accordance with claim 14, wherein: a number N of P-frames are decoded to recover the complete I-frame; and the encoded I-frame replaces the Nth P-frame.
20. (presently allowed) An appliance in accordance with claim 19, wherein: one or more additional P frames are decoded to recover additional I-slices; the additional I-slices allow assembly of additional complete I-frames; and said additional complete I-frames are insertable after encoding into the MPEG data stream at a programmable rate.
21. (presently allowed) An appliance in accordance with claim 14, wherein: additional I-frames are inserted into the I-frame based data stream at a programmable interval.
22. (presently allowed) An appliance in accordance with claim 14, wherein the encoded I-frame replaces the selected P-frame at least once per refresh cycle.
23. (presently allowed) An appliance in accordance with claim 14, wherein the trick play mode features comprise at least one of pause, scan forward, scan backward, jump, and still frame display.
24. (as originally filed) An appliance in accordance with claim 14, wherein the receiver determines whether the data stream is an I-frame based MPEG data stream or a progressive I-slice refreshed MPEG data stream, such that, in the event that the data stream is an I-frame based MPEG data stream, the data stream is stored in the storage device for trick play mode use without further processing.
25. (as originally filed) An appliance in accordance with claim 14, wherein: the receiver determines whether the data stream is an I-frame based MPEG data stream or a progressive I-slice refreshed MPEG data stream; and in the event that the data stream is an I-frame based MPEG data stream, the processor inserts additional I-frames into the data stream prior to storage of the data stream for trick play mode use.
26. (presently allowed) An appliance in accordance with claim 14, wherein the appliance is one of a personal versatile recorder (PVR), a digital video recording device, a set-top terminal, a digital television, or a personal computer.

27. (presently allowed) An appliance in accordance with claim 14, wherein: the encoder re-encodes the P-frames using motion estimation techniques in order to remove the I-slices.